

WHAT IS CLAIMED IS:

1. An optical transmission unit comprising:

a first dispersion compensator which compensates dispersion of a first wavelength-multiplexed signal light,

5 a first optical amplifier which amplifies an output of said first dispersion compensator,

an optical branching filter which splits the first wavelength-multiplexed signal light which has been amplified by said first optical amplifier into at least a second wavelength-multiplexed signal light and a first signal light,

10 a second dispersion compensator which compensates dispersion of the second wavelength-multiplexed signal light, and

a second optical amplifier which amplifies an output of said second dispersion compensator.

15 2. An optical transmission unit according to claim 1, wherein said first and second optical amplifiers include pumping laser diodes having inputs of 50 mW or less.

3. An optical transmission unit comprising:

20 a first dispersion compensator which compensates dispersion of a first wavelength-multiplexed signal light,

a first optical amplifier which amplifies an output of said first dispersion compensator,

a second dispersion compensator which compensates dispersion of a first signal light,

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a second optical amplifier which amplifies an output of said second dispersion compensator, and

an optical coupler which couples an output of said second optical amplifier to an output of said first optical amplifier.

5 4. An optical transmission unit according to claim 3, wherein said first and second optical amplifiers include pumping laser diodes having inputs of 50 mW or less.

5. An optical coupling/branching unit comprising:

10 an optical branching filter which receives a first wavelength-multiplexed signal light which is an output of a first dispersion compensator, outputs a signal light of a first wavelength to an optical receiving unit, and outputs a second wavelength-multiplexed signal light to a second dispersion compensator, and

15 an optical coupler which receives and couples by wavelength multiplexing an output of said second dispersion compensator and an output of a third dispersion compensator and outputs a third wavelength-multiplexed signal light.

20 6. An optical transmission system comprising a first terminal station which transmits a first wavelength-multiplexed signal light at about 10 Gbits/s; a repeater station which receives the first wavelength-multiplexed signal light and transmits a third wavelength-multiplexed signal light; and a second terminal station which receives the third
25 wavelength-multiplexed signal light;

said repeater station including:

a first dispersion compensator which compensates the dispersion of the first wavelength-multiplexed signal light,

an optical receiver which receives a first signal light
5 included in the first wavelength-multiplexed signal light whose dispersion has been compensated,

a second dispersion compensator,

an optical branching filter which splits a signal light
of a first wavelength from the first wavelength-multiplexed
10 signal light whose dispersion has been compensated, transmits the split signal light to said optical receiver and transmits a second wavelength-multiplexed signal light to said second dispersion compensator,

an optical transmitter which transmits a second signal
15 light of the first wavelength,

a third dispersion compensator which compensates dispersion of the second signal light from said optical transmitter, and

an optical coupler which receives an output of said second
20 dispersion compensator and an output of said third dispersion compensator and transmits the third wavelength-multiplexed signal light.